

Claims

1. A positioning system in a mobile communication network which responds position information which is a positioning target to a positioning request from an external client device, the positioning system in the mobile communication network comprising:

at least one node device including a positioning response generation function unit which generates the response of the position information to said external client device based on request accuracy information and request accuracy request class information.

2. The positioning system in the mobile communication network according to claim 1,

wherein said request accuracy request class information comprises at least a first class which indicates to request said node device to respond position information which does not fail to satisfy positioning accuracy requested by said external client device to said external client device.

3. The positioning system in the mobile communication network according to claim 2,

wherein said first class indicates to request said node device to respond an error to said external client device, if the position information which satisfies the positioning accuracy requested by said external client device does not exist.

4. The positioning system in the mobile communication network according to claim 1,

wherein, if the position information does not satisfy positioning accuracy requested by said external client device, said request accuracy request class information comprises at least a second class which indicates to request said node device to respond the position information which is closest to said requested positioning accuracy to said external client device.

5. The positioning system in the mobile communication network according to claim 4,

wherein said second class indicates to request said node device to respond an error to said external client device, if position information that can be responded does not exist.

6. The positioning system in the mobile communication network according to claim 1,

wherein said request accuracy request class information comprises both of a first class which indicates to request said node device to respond position information which does not fail to satisfy positioning accuracy requested by said external client device to said external client device, and a second class which indicates to request said node device to respond the position information which is closest to said requested positioning accuracy to said external client device, if the position information does not satisfy the positioning accuracy requested by said external client device.

7. The positioning system in the mobile communication network according to claim 1,

wherein said positioning system further comprises a holding function unit for retaining said positioning accuracy request class information.

8. The positioning system in the mobile communication network according to claim 1,

wherein said positioning system further comprises a receiving function unit for receiving said request accuracy request class information transmitted by said external client together with the positioning request.

9. The positioning system in the mobile communication network according to claim 1,

wherein, if said external client has transmitted said request accuracy request class information together with the positioning request, said positioning response generation function unit uses the request class information thereof to generate the response of said position information, whereas if said external client has not transmitted said request accuracy request class information together with the positioning request, said positioning response generation function unit uses request accuracy request class information held inside said positioning system in said mobile communication network to generate the response of said position information.

10. A positioning system in a mobile communication network which responds position information which is a positioning target to a positioning

request from an external client device, the positioning system in the mobile communication network comprising:

at least one node device including a positioning response generation function unit which generates the response of the position information to said external client device based on request freshness information and request freshness request class information.

11. The positioning system in the mobile communication network according to claim 10,

wherein said request freshness request class information comprises at least a first class which indicates to request said node device to respond position information which does not fail to satisfy positioning freshness requested by said external client device to said external client device.

12. The positioning system in the mobile communication network according to claim 11,

wherein said first class indicates to request said node device to respond an error to said external client device, if the position information which satisfies the positioning freshness requested by said external client device does not exist.

13. The positioning system in the mobile communication network according to claim 10,

wherein, if the position information does not satisfy positioning freshness requested by said external client device, said request accuracy request class information comprises at least a second class which indicates to request said node device to respond the position information which is closest to said requested positioning freshness to said external client device.

14. The positioning system in the mobile communication network according to claim 13,

wherein said second class indicates to request said node device to respond an error to said external client device, if position information that can be responded does not exist.

15. The positioning system in the mobile communication network according to claim 10,

wherein said request freshness request class information comprises both

of a first class which indicates to request said node device to respond position information which does not fail to satisfy positioning freshness requested by said external client device to said external client device, and a second class which indicates to request said node device to respond the position information which is closest to said requested positioning freshness to said external client device, if the position information does not satisfy the positioning freshness requested by said external client device.

16. The positioning system in the mobile communication network according to claim 10,

wherein said positioning system further comprises a holding function unit for retaining said positioning freshness request class information.

17. The positioning system in the mobile communication network according to claim 10,

wherein said positioning system further comprises a receiving function unit for receiving said request freshness request class information transmitted by said external client together with the positioning request.

18. The positioning system in the mobile communication network according to claim 10,

wherein, if said external client has transmitted said request freshness request class information together with the positioning request, said positioning response generation function unit uses the request class information thereof to generate the response of said position information, whereas if said external client has not transmitted said request freshness request class information together with the positioning request, said positioning response generation function unit uses request freshness request class information held inside said positioning system in said mobile communication network to generate the response of said position information.

19. A positioning system in a mobile communication network which responds position information which is a positioning target to a positioning request from an external client device, the positioning system in the mobile communication network comprising:

at least one node device including a positioning response generation function unit which generates the response of the position information to said

external client device based on request accuracy information and request accuracy request class information, and request freshness information and request freshness request class information.

20. The positioning system in the mobile communication network according to claim 19,

wherein said request accuracy request class information comprises at least a first class which indicates to request said node device to respond position information which does not fail to satisfy positioning accuracy requested by said external client device to said external client device.

21. The positioning system in the mobile communication network according to claim 20,

wherein said first class indicates to request said node device to respond an error to said external client device, if the position information which satisfies the positioning accuracy requested by said external client device does not exist.

22. The positioning system in the mobile communication network according to claim 19,

wherein, if the position information does not satisfy positioning accuracy requested by said external client device, said request accuracy request class information comprises at least a second class which indicates to request said node device to respond the position information which is closest to said requested positioning accuracy to said external client device.

23. The positioning system in the mobile communication network according to claim 22,

wherein said second class indicates to request said node device to respond an error to said external client device, if position information that can be responded does not exist.

24. The positioning system in the mobile communication network according to claim 19,

wherein said request accuracy request class information comprises both of a first class which indicates to request said node device to respond position information which does not fail to satisfy positioning accuracy requested by said external client device to said external client device, and a second class which

indicates to request said node device to respond the position information which is closest to said requested positioning accuracy to said external client device, if the position information does not satisfy the positioning accuracy requested by said external client device.

25. The positioning system in the mobile communication network according to claim 19,

wherein said positioning system further comprises a holding function unit for retaining said positioning accuracy request class information.

26. The positioning system in the mobile communication network according to claim 19,

wherein said positioning system further comprises a receiving function unit for receiving said request accuracy request class information transmitted by said external client together with the positioning request.

27. The positioning system in the mobile communication network according to claim 19,

wherein, if said external client has transmitted said request accuracy request class information together with the positioning request, said positioning response generation function unit uses the request class information thereof to generate the response of said position information, whereas if said external client has not transmitted said request accuracy request class information together with the positioning request, said positioning response generation function unit uses request accuracy request class information held inside said positioning system in said mobile communication network to generate the response of said position information.

28. The positioning system in the mobile communication network according to claim 19,

wherein said request freshness request class information comprises at least a third class which indicates to request said node device to respond position information which does not fail to satisfy positioning freshness requested by said external client device to said external client device.

29. The positioning system in the mobile communication network according to claim 28,

wherein said third class indicates to request said node device to respond an error to said external client device, if the position information which satisfies the positioning freshness requested by said external client device does not exist.

30. The positioning system in the mobile communication network according to claim 19,

wherein, if the position information does not satisfy positioning freshness requested by said external client device, said request accuracy request class information comprises at least a fourth class which indicates to request said node device to respond the position information which is closest to said requested positioning freshness to said external client device.

31. The positioning system in the mobile communication network according to claim 30,

wherein said fourth class indicates to request said node device to respond an error to said external client device, if position information that can be responded does not exist.

32. The positioning system in the mobile communication network according to claim 19,

wherein said request freshness request class information comprises both of a third class which indicates to request said node device to respond position information which does not fail to satisfy positioning freshness requested by said external client device, and a fourth class which indicates to request said node device to respond the position information which is closest to said requested positioning freshness to said external client device, if the position information does not satisfy the positioning freshness requested by said external client device.

33. The positioning system in the mobile communication network according to claim 19,

wherein said positioning system further comprises a holding function unit for retaining said positioning freshness request class information.

34. The positioning system in the mobile communication network according to claim 19,

wherein said positioning system further comprises a receiving function

unit for receiving said request freshness request class information transmitted by said external client together with the positioning request.

35. The positioning system in the mobile communication network according to claim 19,

wherein, if said external client has transmitted said request freshness request class information together with the positioning request, said positioning response generation function unit uses the request class information thereof to generate the response of said position information, whereas if said external client has not transmitted said request freshness request class information together with the positioning request, said positioning response generation function unit uses request freshness request class information held inside said positioning system in said mobile communication network to generate the response of said position information.

36. The positioning system in the mobile communication network according to claim 19,

wherein, if the position information does not satisfy positioning accuracy requested by said external client device, said request accuracy request class information is set to a second class which indicates to request said node device to respond the position information which is closest to said requested positioning accuracy to said external client device,

wherein, if the position information does not satisfy positioning freshness requested by said external client device, said request freshness request class information is set to a fourth class which indicates to request said node device to respond the position information which is closest to said requested positioning freshness to said external client device, and

wherein, if position information which satisfies both the positioning accuracy and the positioning freshness requested by said external client device does not exist, said node device responds the position information with the highest positioning accuracy to said external client device.

37. The positioning system in the mobile communication network according to claim 19,

wherein, if the position information does not satisfy positioning accuracy requested by said external client device, said request accuracy request class information is set to a second class which indicates to request said node device

to respond the position information which is closest to said requested positioning accuracy to said external client device,

wherein, if the position information does not satisfy positioning freshness requested by said external client device, said request freshness request class information is set to a fourth class which indicates to request said node device to respond the position information which is closest to said requested positioning freshness to said external client device, and

wherein, if position information which satisfies both the positioning accuracy and the positioning freshness requested by said external client device does not exist, said node device responds the position information with the newest positioning freshness to said external client device.

38. The positioning system in the mobile communication network according to claim 19,

wherein, if the position information does not satisfy positioning accuracy requested by said external client device, said request accuracy request class information is set to a second class which indicates to request said node device to respond the position information which is closest to said requested positioning accuracy to said external client device,

wherein, if the position information does not satisfy positioning freshness requested by said external client device, said request freshness request class information is set to a fourth class which indicates to request said node device to respond the position information which is closest to said requested positioning freshness to said external client device, and

wherein, if position information which satisfies both the positioning accuracy and the positioning freshness requested by said external client device does not exist, said node device responds the position information to said external client device based on priority information showing whether the freshness or the accuracy is prioritized.

39. The positioning system in the mobile communication network according to claim 38,

wherein, when said positioning system in said mobile communication network is set in such a way that said priority information gives a high priority to the accuracy, said node device responds the position information with the highest accuracy to said external client device.

40. The positioning system in the mobile communication network according to claim 38,

wherein, when said positioning system in said mobile communication network is set in such a way that said priority information gives a high priority to the freshness, said node device responds the position information with the newest freshness to said external client device.

41. A positioning method in a mobile communication network which responds position information which is a positioning target to a positioning request from an external client device,

wherein the response of the position information to said external client device is generated based on request accuracy information and request accuracy request class information.

42. A positioning method in a mobile communication network which responds position information which is a positioning target to a positioning request from an external client device,

wherein the response of the position information to said external client device is generated based on request freshness information and request freshness request class information.

43. A positioning method in a mobile communication network which responds position information which is a positioning target to a positioning request from an external client device,

wherein the response of the position information to said external client device is generated based on request accuracy information and request accuracy request class information, and request freshness information and request freshness request class information.

44. A positioning server device in a mobile communication network which responds position information which is a positioning target to a positioning request from an external client device, the positioning server device in the mobile communication network comprising:

a positioning response generation function unit which generates the response of the position information to said external client device based on request accuracy information and request accuracy request class information.

45. The positioning server device in the mobile communication network according to claim 44,

wherein said request accuracy request class information comprises a first class which indicates to request said positioning server device to respond position information which does not fail to satisfy positioning accuracy requested by said external client device to said external client device, and a second class which indicates to request said positioning server device to respond the position information which is closest to said requested positioning accuracy to said external client device, if the position information does not satisfy the positioning accuracy requested by said external client device.

46. The positioning server device in the mobile communication network according to claim 44,

wherein said positioning server device further comprises a storage function unit which stores said request accuracy request class information for each said external client device.

47. The positioning server device in the mobile communication network according to claim 44, further comprising:

a receiving function unit which receives said request accuracy request class information transmitted by said external client together with the positioning request.

48. The positioning server device in the mobile communication network according to claim 44,

wherein said positioning server device further comprises a storage function unit which stores said request accuracy request class information for each said external client device;

a receiving function unit which receives said request accuracy request class information transmitted by said external client together with the positioning request; and

a merge function unit which, if said receiving function unit has received said request accuracy request class information transmitted by said external client together with the positioning request, selects said received request class information, and which, if said receiving function unit has not received said request accuracy request class information, selects said request accuracy request

class information already stored in said storage function unit.

49. A positioning server device in a mobile communication network which responds position information which is a positioning target to a positioning request from an external client device, the positioning server device in the mobile communication network comprising:

a positioning response generation function unit which generates the response of the position information to said external client device based on request freshness information and request freshness request class information.

50. The positioning server device in the mobile communication network according to claim 49,

wherein said request freshness request class information comprises a first class which indicates to request said positioning server device to respond position information which does not fail to satisfy positioning freshness requested by said external client device to said external client device, and a second class which indicates to request said positioning server device to respond the position information which is closest to said requested positioning freshness to said external client device, if the position information does not satisfy the positioning freshness requested by said external client device.

51. The positioning server device in the mobile communication network according to claim 49,

wherein said positioning server device further comprises a storage function unit which stores said request freshness request class information for each said external client device.

52. The positioning server device in the mobile communication network according to claim 49, further comprising:

a receiving function unit which receives said request freshness request class information transmitted by said external client together with the positioning request.

53. The positioning server device in the mobile communication network according to claim 49,

wherein said positioning server device further comprises a storage function unit which stores said request freshness request class information for

each said external client device;

a receiving function unit which receives said request freshness request class information transmitted by said external client together with the positioning request; and

a merge function unit which, if said receiving function unit has received said request freshness request class information transmitted by said external client together with the positioning request, selects said received request class information, and which, if said receiving function unit has not received said request freshness request class information, selects request freshness request class information already stored in said storage function unit.

54. A program executed by a positioning server device in a mobile communication network which responds position information which is a positioning target to a positioning request from an external client device, the program comprising:

a positioning response generation process of generating the response of the position information to said external client device based on request accuracy information and request accuracy request class information.

55. A program executed by a positioning server device in a mobile communication network which responds position information which is a positioning target to a positioning request from an external client device, the program comprising:

a positioning response generation process of generating the response of the position information to said external client device based on request freshness information and request freshness request class information.